MICRO-768 Battery Tester

User Manual

NOTE:

- Carefully read the user manual before using, and keep it well for future reference.
- Carefully check the device parts list before using.For any doubt, contact Launch distributor immediately.
- Due to the product upgrade, tiny difference between the user manual and the device will not be further noticed. Take the device as standard.

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Chapter 1 Product Summary

1.1 Product Profile

MICRO-768 Battery Tester adopts currently the world's most advanced conductance testing technology to easily, quickly and accurately measure the actual cold cranking amps capability of the vehicle starting battery, healthy state of the battery itself, and common fault of the vehicle starting system and charging system, which can help maintenance personnel to find the problem quickly and accurately, thus to achieve quick vehicle repair.

1. Test all automotive cranking lead acid battery, including ordinary lead acid battery, AGM flat plate battery, AGM spiral battery, and Gel battery, etc.
2. Directly detect bad cell battery.
3. Polarity reverse connection protection, reverse connection will not damage the tester or affect the vehicle and battery.
4. Directly test the battery with loss of electricity, no need to full charge before testing.
5. Testing standards include currently the world's majority of battery standards, CCA, BCI, CA, MCA, JIS, DIN, IEC, EN, SAE, GB.
6. Support multi-languages, customer can select different language package, which includes: Chinese Simple, Chinese Traditional, English, Japanese, Russian, Spanish, French, Italian, German, etc. Other languages can also be customized according to user's need.

7. With common additional functions, such as voltmeter, ammeter, thermometer, even as standby power for ECU.
8. Store 100 groups of test data for check and print.

1.2 Product Function

Main functions of MICRO-768 battery tester include: battery test, cranking test, charging test and other additional functions.

Battery test is mainly targeted to analyze the battery healthy status to calculate the actual cold cranking capability of the battery and the aging extent, which provide reliable analysis evidence for the test and maintenance of the battery.It notifies the user to replace battery in advance when the battery is getting aged.

Cranking test is mainly to test and analyze the starting motor. Through testing the actual required cranking current and cranking voltage of the starting motor, it can find out whether the starting motor works fine.There are several reasons why the starting motor is abnormal: lubricating system fault causing the starting loaded torque increasing or rotor friction of the starting motor causing the increasing friction of the starting motor itself.

Charging test is to check and analyze the charging system, including generator, rectifier, rectifier diode, etc., thus to find out whether the output voltage of the generator is normal, the rectifier diode works fine and the charging current is normal.Suppose one of the above mentioned parts is not in normal situation, it will lead to over charge or incomplete charge of the battery, thus the battery will be quickly damaged and also greatly shorten the using life of other loaded electrical appliance.

Additional functions include:

View test result, print test result, voltmeter, ammeter, thermometer and temperature compensation, thermometer unit choice, QC mode, client code setting, set language, set date and time format, date and time adjustment, set user info, screen light adjustment, set printer definition, standby power function.

1.3 Technical Parameter:

1) Cold Cranking Amps Measure Range:

Measure Standard	Measure Range
CCA	100-2000
BCI	100-2000
CA	100-2000
MCA	100-2000
JIS	26A17--245H52
DIN	100-1400
IEC	100-1400
EN	100-1400
SAE	100-2000
GB	100-1400

2) **Voltage Measure Range：1.0-30VDC.**

3) **Current Measure Range：0-900A DC/AC.**

4) **Temperature Measure Range**：-18°C - +70°C.

1.4 Working Enviornment Requirement

Working Environment Temp.: -20°C-60°C

It is applicable for automotive manufacturers, automotive maintenance and repair workshops, automotive battery factories, automotive battery distributors, and educational organizations, etc.

Chapter 2 Tester Structure

MICRO-768 mainly consists of battery tester main unit, testing cables and current clamp.

MICRO-768 Battery Tester main unit cover is made of ABS acid-resistant plastic.

Removable testing cables (With attached picture)

Removable current clamp (With attached picture)

Chapter 3 Operation

3.1 Pre-Test

3.1.1 Connect Tester

- Before test, clean battery poles with metal wire brush and alkaline cleaner to avoid the tolerance caused by oil and dust to the test result.
- For Group31 or side-installed battery, connect and fix the terminal wiring connector. Otherwise, inaccurate test result will be caused due to wrong installation or dirty or bad wiring connectors.
- While testing, ensure none of the in-vehicle electrical appliance is on, doors are closed and the ignition key is in OFF status.
- Connect the red test clamp with battery anode and the black test clamp with cathode.

Shake the clamps back and forth to make sure they are well connected.

Tester requires the two clamps are well connected with the battery poles, otherwise, the test cannot go on. When enter the battery test program, screen prompts "**Check Connection**" (See below picture).Do clean the poles and re-connect in the right way.

Tester has reverse connection protection function. When clamps are reversely connected, tester will prompt "**Reverse Connection**" (See below picture), but it damages neither the tester nor the automotive load.

NOTE: For parallel connected batteries, break off the cathode connection first, then do single test to each battery.Suppose cathode connection is not cut off, there will be error in test result.

3.1.2 Key Description

- Up and Down keys

  Select upwards or downwards via white UP and DOWN keys.

- Return key

  Return to previous menu via blue RETURN key.

- OK key

  Confirm the selection via green OK key

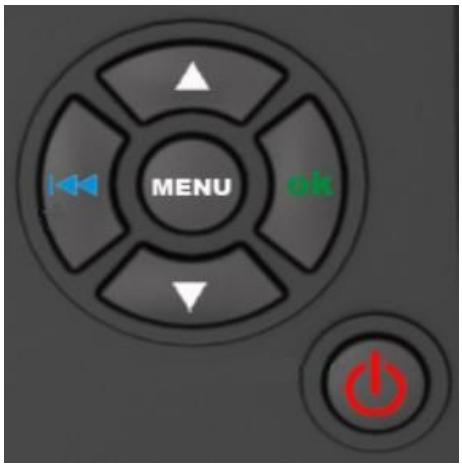
-

MENU key

  Enter additional function program via MENU key.

- Power key

  Turn on/off the tester.(Refer to 3.2 Tester Startup)



Key Photo

3.1.3 Connect Current Clamp

To test cranking amps and charging current, first connect the current clamp before startup, then turn on the current clamp power swtich.

After tester startup, current clamp is able to work.

Press the reset key of the current clamp and connect the current clamp jaw to the anode wiring between the battery to be tested and the generator. See below picture.

As the minimum width of the current clamp jaw is only 28mm, choose the connection cable or connection pole with diameter less than 28mm to test. Otherwise, the current clamp jaw cannot close completely.

NOTE: 1. Current clamp jaw must close to avoid test tolerance.

2. Current clamp uses 9V alkaline battery. Turn the clamp power off after using the current clamp.

3. Before testing the current, take off the current clamp from the battery positive connection cable, and reset.

3.2 Tester Startup

Tester will start up after pressing the power key, and display the customized logo interface (Default voltmeter is ON) refer to figure 1.

Figure 1, Startup Interface with Voltmeter On

At the bottom left of the startup interface, "▬" shows the real time capacity of the internal 9V battery. When the capacity of the 9V battery is not sufficient, do replace it in time to avoid effect to the usage of the additional functions.

By default, at the middle bottom of the startup interface, it displays the voltmeter value, which can be used as DC voltmeter.DC voltmeter measure range is 1.0-30VDC.**(Caution: Over this measure range, it will damage the tester.**）

Voltmeter function can be set as "ON/OFF" in the voltmeter under Additional Functions.

When Voltmeter is ON and no other operations after tester startup, screen will show the startup interface all the time. In this situation, it can be used as a DC Voltmeter.When OK key is pressed, tester enters the battery test program. Press MENU key, it enters additional function program.

When Voltmeter is OFF, screen shows the startup interface as below figure 2. After 2seconds, it automatically enters the battery test program.Press MENU key within this 2 seconds, it enters additional function program.

Figure 2, Startup Interface with Voltmeter Off

3.3 Battery Test

After entering battery test program, tester displays the tester model and version approx. 2 seconds, see figure 3

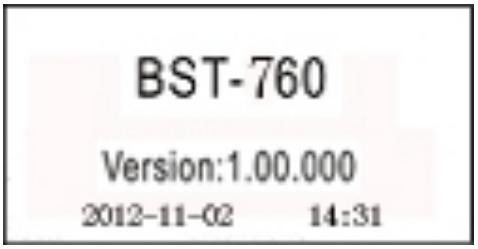


Figure 3, Interface with tester model and version

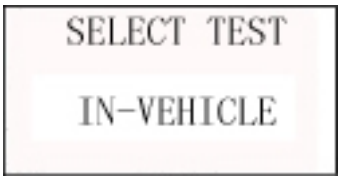
The bottom line of the interface shows the current date and time, whose format can be edited and adjusted in the Additional Functions. For details, refer to Additional Function 3.8.10 "Set Date and Time" and 3.8.11 "Date and Time Adjustment".

Tester will display the following contents in a sequence, select accordingly.

3.3.1 IN-VEHICLE or OUT-OF-VEHICLE

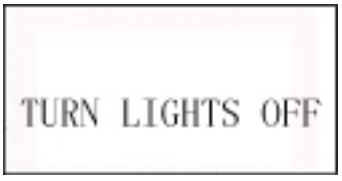
Press UP/DOWN key to select the battery location, in vehicle or out of vehicle, then press OK key to confirm.

1) IN-VEHICLE means battery is connected with vehicle generator or vehicle electrical appliance.



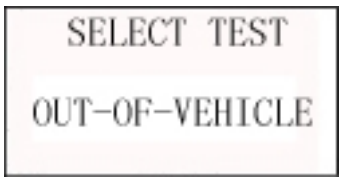
When surface charge detected by the tester, it prompts "SURFACE CHARGE, TURN LIGHTS ON".

Turn lights on as prompted to eliminate battery surface charge, tester will then display the following messages in a sequence:



Now the tester detects the surface charge has been eliminated, turn lights off as prompted, then press OK key. The tester will recover automatic test.

2) OUT-OF-VEHICLE means battery is not connected with any of the vehicle loaded, i.e. battery connection is cut off.

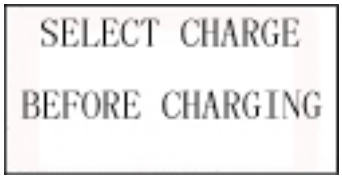


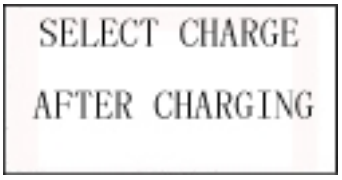
3.3.2 Select Battery Charge State

After selecting the battery location, tester will prompt to select the battery charge status, i.e. **Before Charge** or **After Charge**.

Press UP/DOWN key to select battery charge status, then press OK key to confirm. In this way, it ensures a more accurate test result.

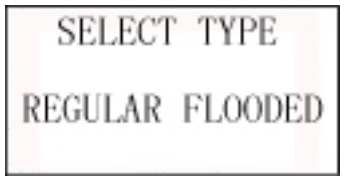
NOTE: In Vehicle, select Before Charge for Cold Vehicle and After Charge for Hot Vehicle.

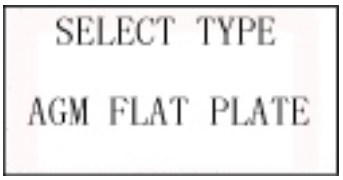


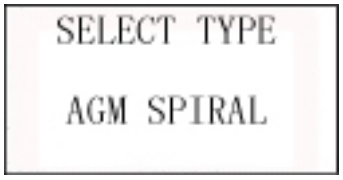


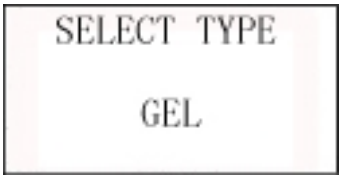
3.3.3 Select Battery Type

After the battery charge status selected, tester will prompt to select battery type, i.e. Regular Flooded, AGM Flat Plate or AGM Spiral, and Gel battery.Press UP/DOWN key to select battery type, and press OK key to confirm.

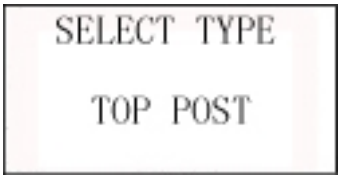


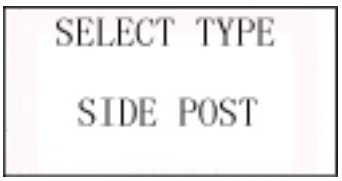


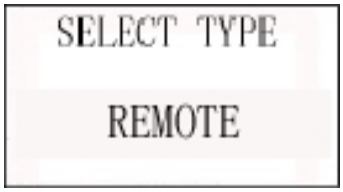




When it's IN-VEHICLE test, battery installation way shall also be selected, e.g. TOP, SIDE or REMOTE (This selection is no need for OUT-OF-VEHICLE), then press OK key to confirm.REMOTE is adopted for some in vehicle battery which is too tightly installed to use the test clamps to connect the battery poles.







NOTE: For REMOTE test, there will be a little tolerance. For any doubt, take off the battery and select "OUT-OF-VEHICLE" to re-test.

3.3.4 Battery System Standard and Rating

MICRO-768 battery tester will test each battery according to the selected system and rating.

Use UP/DOWN key to select according to the actual **system standard and rating** marked on the battery. See in the below picture, the arrow indicated location.

CCA：Cold Cranking Amps, specified by SAE&BCI, most frequently used value for starting battery at 0°F (-18°C)

BCI: Battery Council International standard

CA: Cranking Amps standard, effective starting current value at 0°C

MCA: Marine Cranking Amps standard, effective starting current value at 0°CJapan Industrial Standard, displayed on the battery as combination of the numbers and letters, e.g. 55D23,80D26.

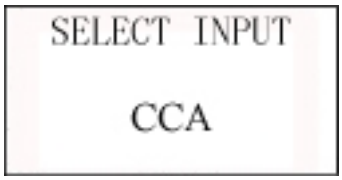
DIN：German Auto Industry Committee Standard

IEC：Internal Electro technical Commission Standard

EN：European Automobile Industry Association Standard

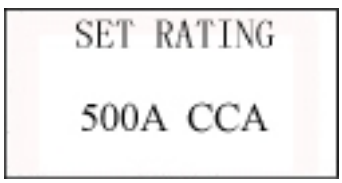
SAE: Society of Automotive Engineers Standard

GB：China National Standard.



Rating range as following:

Measure Standard	Measure Range
CCA	100-2000
BCI	100-2000
CA	100-2000
MCA	100-2000
JIS	26A17--245H52
DIN	100-1400
IEC	100-1400
EN	100-1400
SAE	100-2000
GB	100-1400



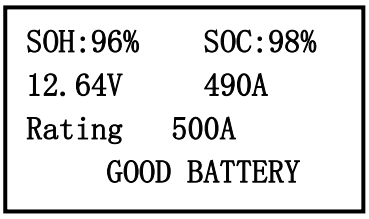
Input correct test standard and rating, press OK key, tester starts to test, and dynamic interface "TESTING" prompted. See below.

It takes around 3 seconds to display the battery test result.

3.3.5 Battery Test Result

Battery test result includes 5 types as following:

Good Battery

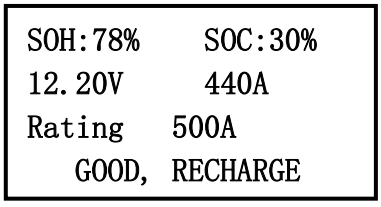


The battery is without any problem, please be relaxed to use!

NOTE: SOH means State of Health.

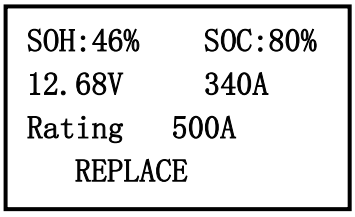
SOC means State of Charge.

2) Good, Recharge



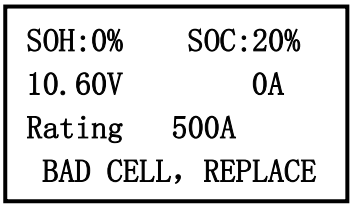
Good battery but low current, recharge before using.

3) Replace



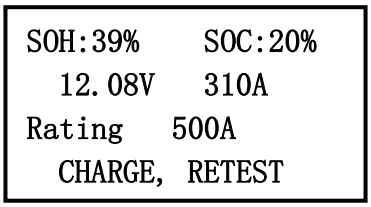
The battery is near to or already reached the end of the using life, replace battery, otherwise, bigger danger will be followed.

4) Bad Cell, Replace



Battery interior damaged, broken cell or short circuit, replace battery.

5) Charge, Retest



Unstable battery shall be recharged and retested to avoid error.If same test result appears after recharge and retest, the battery is regarded as damaged, replace the battery.

NOTE: If "Replace" resulted from IN-VEHICLE mode, it might be the reason that vehicle cable is not well connected with the battery.Ensure to cut off the cable and retest the battery under OUT-OF-VEHICLE before making a decision to replace battery.

NOTE: After testing, if need to return, press RETURN key to directly return to the startup interface.

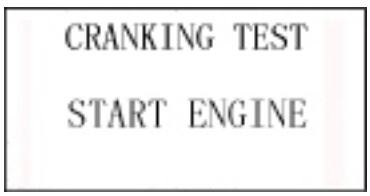
After battery test:

If it is "OUT-OF-VEHICLE" test state, press OK key, it will print the test result.

If it is "IN-VEHICLE" test state, press OK key will bring to Cranking Test.

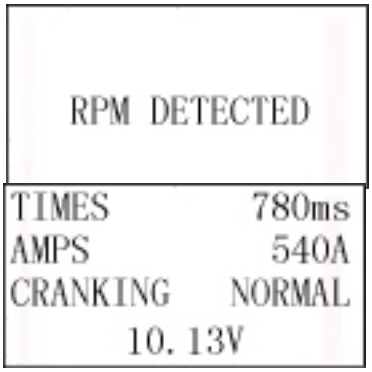
3.4 Cranking Test

Connect with current clamp in advance. Under bad connection, tester will not test the actual cranking amps accurately.



Refer to 3.1.3 for current clamp connection.

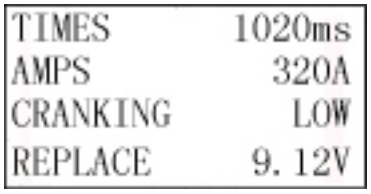
Starting the engine as prompted, tester will automatically complete the cranking test and display the result.



Normally, cranking voltage value lower than 9.6V is regarded as abnormal, higher than 9.6V is OK.

Test result of the tester includes actual cranking voltage, actual cranking amps, and actual cranking time.

When cranking test is abnormal, battery test result will also be displayed at the same time.See below picture:



This is for the convenience of the maintenance personnel to quickly know the whole state of the starting system according to the data.

After testing finished, do not shut down the engine, press OK key to enter Charging Test.

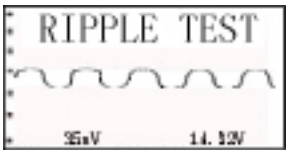
3.5 Charging System and Rectifier Diode Test

When enter the charging test, tester will prompt "Charging Test?"

Press OK key again to start the charging test.

NOTE: Do not shut down the engine during the test.All electrical appliance and device are in OFF state.Turn on/off any electrical appliance in the vehicle during the test will affect the accuracy of the test result.

Tester will do the following tests in a sequence:

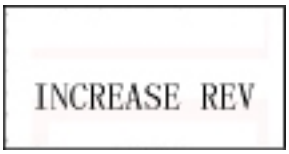


For ripple test, tester will display the real time ripple and meanwhile, shows ripple volt and charging volt values at the bottom line.

It takes approx. 6 seconds for the ripple test.

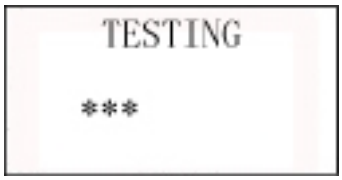
After the ripple test, tester will automatically start the loaded voltage test.See below picture:

Loaded Volt Test takes approx. 3 seconds, then it hints "Step on accelerator to increase engine rotating speed".See below picture:

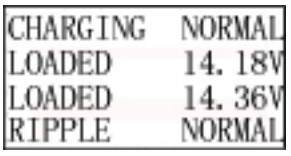


Operate accordingly to increase the engine rotating speed to 3000turns or above, and keep for 5 seconds.

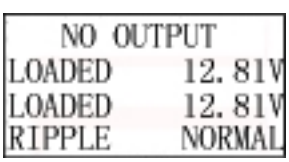
Tester starts the charging volt test after increase rev detected.See below picture:



After the test finished, tester displays the effective charging volts, ripple test result and charging test result.See below picture:



NOTE: If no increase rev detected, it shall be the fault of generator regulator or connection with battery failed.Tester will try 3 times to further detect, if still failed, it will skip the increase rev detect and the test result displays "No Volt Output".See below picture:



Check the connection between generator and battery, then retest.

Charging Test Result:

1) Charging Volt: Normal

Charging system shows the generator output normal, no problem detected.

2) Charging Volt: Low

Charging volt of the charging system is low.

Check drive belt of the generator whether slip or running off. Check the connection between generator and battery is normal or not.

If both of the drive belt and the connection are in good condition, follow the manufacturer's suggestion to eliminate generator fault.

3) Charging Volt: High

Generator output volt is high.

Since most of the vehicle generators are using internal regulator, the generator assembly has to be replaced.(Some old style cars are using external regulator, then directly replace the regulator.)

The normal high volt of the voltage regulator is maximum 14.7±0.5V.If charging volt is too high, it will overcharge the battery. Therefore, the battery life will be shortened and troubles will be caused.

4) No Volt Output:

No generator volt output is detected.Check the generator connection cable, the drive belt of generator and engine whether normal or not.

5) Diode Test:

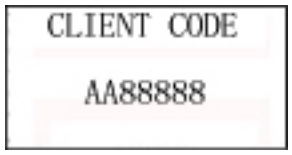
Through the test of charging current ripple, tester will find out whether the diode is normal or not.When ripple volt is too high, it proves at least one diode is damaged. Check and replace the diode.

Till now, all tests have been done

If client code setting function is off, press OK key again, it prompts "Print Result?", press OK key to print.If client code setting function is on, press OK key again, it prompts "Print Result?", press OK key to input client code.After client code input, press OK key again, it prompts "Print Result?", press OK key to print.

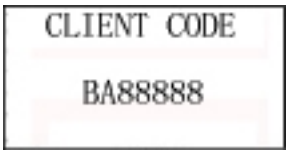
3.6 client code Input

Client code in a sequence, 1nd to 7th digits are letters or numbers.When press UP/DOWN keys, numbers and letters will be scrolling displayed, select the number or letter needed, press OK key to confirm and carry on the input for next digit.

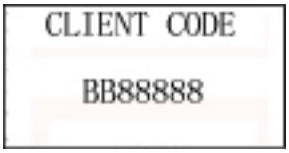


For example, to input "".

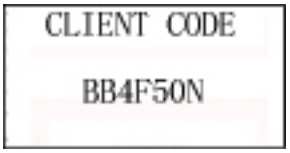
Press UP/DOWN key to select the first Chinese character "粤", press OK to finish the first digit input.



Press UP/DOWN key to select the second letter "B", press OK to finish the second digit input.



Till the 7th digit input is finished.



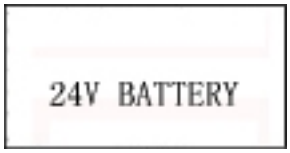
Press OK key again, tester will print out the test result including the plate number.

NOTE: For languages other than Chinese, this function is client code input, input method is the same (first digit changed to number or letter).

3.7 24V System Test

Ordinary 24V battery group combines two 12V batteries in series connection. Therefore, when testing 24V battery, tester will prompt "24V Battery", divide the

batteries and test one by one. It's not necessary to break off the connection cable (Comparatively, the parallel connected battery group must cut off the cathode connection), test method is same as testing single 12V battery.



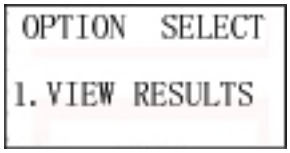
For 24V charging and cranking tests, connect the red clamp to the anode of 24V battery group and the black clamp to the cathode of 24V battery group (NOTE: it's not the anode and cathode of the single battery but battery group), select IN-VEHICLE, screen displays "24V Battery", ignore the prompt, after 3 seconds, the tester will skip battery test program and enter the cranking test directly. Follow the method of 12V system test to complete the 24V charging and cranking tests. The test process is same as 12V system.

3.8 Additional Function

Press MENU key to enter Additional Function (See 3.2 Tester Startup). Following option and operation can be done.

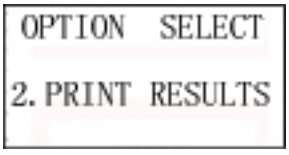
3.8.1 View Results

View results from the last test by pressing OK key.

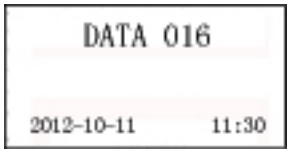


3.8.2 Print Results

Tester can view the latest 100 groups of test data, and print out any group for reference via the thermal printer. Press OK key to enter.



After enter, search the test results by date and time, press OK key.



NOTE: when internal memory is full, tester will automatically clear the earliest test results.Or, select "Memory Reset" under "QC Mode" at Additional Function to clear data in memory and store data all over again.

NOTE: Once reseted, all data will be cleared and cannot be recovered.

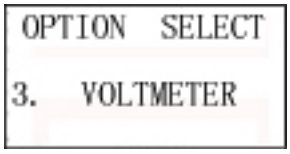
3.8.3 Voltmeter

MICRO-768 battery tester can also be used as DC voltmeter.

The working range is 1.0-30V DC.

CAUTION: MICRO-768 tester may be damaged when connected to voltage above 30V!

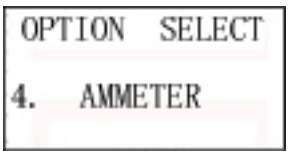
This function can set the voltmeter On/Off at the bottom line of the startup interface.



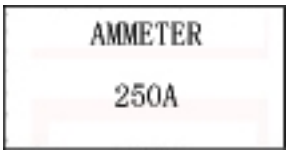
After successful setup, it shows "OK" for 2 seconds, then return to the previous interface.

3.8.4 Ammeter

Tester can be used as an ordinary ammeter via the attached current clamp.



Press OK key to display the ammeter interface.

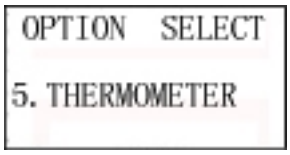


Caution: 1. Turn the current clamp power off as soon as the ammeter test done.Otherwise, it will shorten the life of the internal battery.

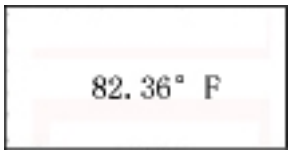
2. Before each testing, take off the current clamp from anode, and reset.

3.8.5 Thermometer

Tester integrates internally a temp sensor, which detects the ambient environment temperature.

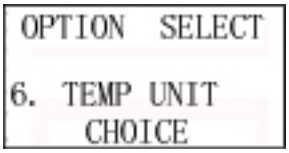


Press OK key to display the thermometer interface.



3.8.6 Thermometer Unit Choice

This option is to set Fahrenheit temperature or Celsius temperature.



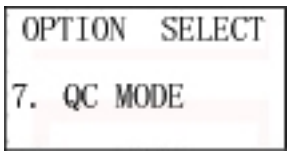
Firstly, press OK key one time, then use UP/DOWN arrow to choose ℃ or ℉.After successful setup, it shows "OK" for 2 seconds, then return to the previous interface.

3.8.7 QC Mode

In QC mode, tester will simplify the test input process, which makes the battery test much faster and easier. Meanwhile, tester will count the test for the purpose of analyzing and tracking the battery quality.

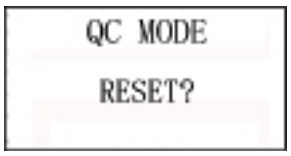
This function is applicable for vehicle manufacturer and maintenance workshop to test and analyze the newly purchased battery, and also for the battery factory to inspect and analyze the outgoing batteries.

QC function is off by default.



After successful setup, it shows "OK" for 2 seconds, then return to the previous interface.

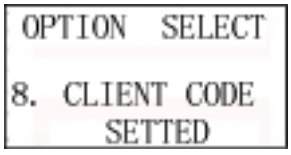
In addition, memory reset in QC mode will clear up all stored data, including the 100 groups of data viewed in "Print Results". Once reset, data cannot be recovered.



The number at bottom line is the value counted by QC counter.

3.8.8 client code Input Function

This option is to set client code input function ON or OFF.

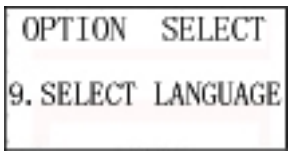


After successful setup, it shows "OK" for 2 seconds, then return to the previous interface.

3.8.9 Set Language

This option is to let user select language.

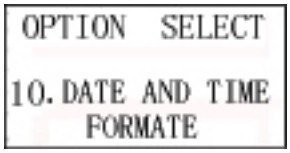
System contains multi-language package, including Chinese, English, Russian, Japanese, Spanish, German, French, Italian, etc.



After successful setup, it shows "OK" for 2 seconds, then return to the previous interface.

3.8.10 Set Date and Time Format

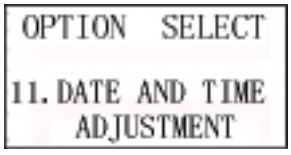
This option is to set date and time format, and time display in 12-hour or 24-hour. Default format is MM/DD/YY, 12-hour.



After successful setup, it shows "OK" for 2 seconds, then return to the previous interface.

3.8.11 Date and Time Adjustment

This option is to adjust and check the system date and time.



Adjustment is in the sequence of Year, Month, Date, Hour, Minute. This adjustment sequence does not affect the date and time format.

1. Press UP/DOWN key to modify the last two digits of the year. Press confirm key to enter the month adjustment.
2. Press UP/DOWN key to modify the month. Press confirm key to enter the date adjustment.
3. Press UP/DOWN key to modify the date. Press confirm key to enter the hour adjustment.

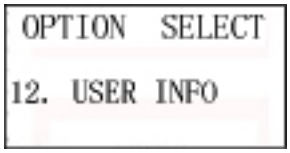
4. Press UP/DOWN key to modify the hour. Press confirm key to enter the minute adjustment.
5. Press UP/DOWN key to modify the minute. Press confirm key till OK displayed.
6. After adjustment, tester will return to the startup interface.
7. During time adjustment, time number will flash, long press the key to increase or reduce the number.

Note: During time adjustment, pressing of the UP, DOWN or CONFIRM key has to be over 1 second to avoid operation by mistake.

To modify the number, long press the UP/DOWN key, the number will automatically and continuously increase or reduce.

NOTE: In date and time setting, return key is invalid in consideration of protecting system time. Complete setting of "YMDHM" has to be done.If no need to set, directly press OK key for 5 times to return.

3.8.12 Set User Infomartion



This option is to set information on maintenance station code, telephone, address, website, etc. Presently, it supports only English letter and number input. Maximum 8 lines are allowed and each line 21 characters including Enter character.

If choose enter character, input in another new line.

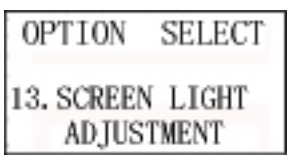
For each character setting, it is space by default.

Suppose to end the input halfway, continuosly press the OK key for 4 times to complete the setting.

After successful setup, it shows "OK" for 2 seconds, then return to the previous interface.

If need to reinput the user information, press Ok key to open the information inputted last time, long press MENU key to delete old information and reinput.

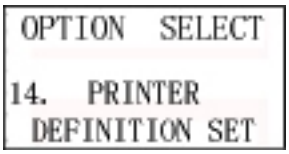
3.8.13 Screen Light Adjustment



This function is to adjust the screen backlight brightness for power saving mode and for clear view of the displayed characters under the sunlight.

Brightness range is adjustable from 1-4.Default brightness value is 2. Press UP/DOWN key to set. After successful setup, it shows "OK" for 2 seconds, then return to the previous interface.

3.8.14 Set Printer Definition



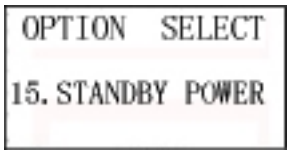
This function is to adjust the clarity of the printed character to ensure a good printing effect under various environment and condition.

Definition range is adjustable from 1-9.Default clarity value is 4. Press UP/DOWN key to set.After successful setup, it shows "OK" for 2 seconds, then return to the previous interface.

NOTE:

The printer definition is inversely proportional to the printing speed. Moreover, higher definition takes more power current.

3.8.15 Standby Power Function



This function is to set standby power, which is OFF by default.

For some luxury vehicle, ECU must be power on. Once power off, ECU will automatically locked.

Standby power function offers ECU power for short time when the vehicle battery needs to be replaced to avoid automatic lock.

When standby power function is ON, tester will use internal 9V battery to supply power after its clamps are connected in principle of "Red to Anode & Black to Cathode" with the battery connection cable.

CAUTION: when standby power function is ON, do not touch Red & Black clamps with each other to avoid short circuit.

After using, press Return key, tester will automatically turn off the standby power.

NOTE: 9V battery, due to its small capacity, can only supply power for short time.Before using the tester as standby power, make sure the internal 9V battery is with sufficient capacity, and try to complete the battery replacement in a short time to avoid the automatic lock caused by power off.

Chapter 4 Daily Maintenance

4.1 Eliminate Common Fault

4.1.1 Screen Not Light

- Check whether the Power is turned on.
- Check connection with the battery whether it's well connected.
- Battery voltage is probably too low to drive the tester (lower than 1.0V). Fully charge the battery and retest.
- Internal 9V battery may need to be replaced. Replace the 9V battery and retest.

4.1.2 Printer Common Fault

Printer paper jam: paper not properly placed, causing paper skew. Open the paper box and reload the paper.

Paper Not Move: paper used up. Replace new print paper.

Low Definition: Set printer definition under Additional Function (refer to 3.8.14).

4.1.3 Current Clamp Common Fault

"Low Voltage" indicator flashes, replace the internal 9V battery of the current clamp. Displayed current value is 0A/1A/2A, or over 900A, or messy code, no Reset before the test or the actual current exceeds the measure range.

4.2 Replace Internal Battery

MICRO-768 battery tester uses one 9V battery (alkaline battery suggested) to test the battery with low voltage at 1V and to perform the additional functions.

When testing battery, screen shows internal battery capacity is not sufficient, do replace the battery in time.When 9V battery not working, tester can still test the battery with low voltage at 5.5V.Steps of replacing battery are as following:

Step1 use a screw driver to loosen the battery box cover screw and take off the battery cover.

Step2 Insert a 9V battery. There are anode and cathode marks in battery box and also a fixing tip. Reversely placed battery cannot be laid flat. Do not force the battery down, otherwise the battery box tip will be damaged.

Step3 Cover the battery box, and fix the screw.

Chapter 5 Warranty Clause

The warranty clause is only applicable to users and distributors who purchased Lancol products via the regular process.